**Analytical questions:**

Is urban forest construction an effective measure to offset the increasing CO2 emissions that are caused urban expansion?

Can we develop a model to estimate the carbon storage (CS) using vegetation index (VI) data obtained by TM images?

**Aspects of the data and the phenomenon**

The data was taken from TM images for 4 years from 1984 to 2014 and therefore had to be normalised to eliminate the effect of environmentally introduced radiometric properties.

To create a model sample plots where identified within the region of interest with the samples being randomly selected to ensure that they represented different landcover types.

Pearson’s correlation coefficients were used to select the best VI to use as an independent variable in the model to predict the CS value.

**Structured comparison**

The spatio-temporal analysis created two types of visualisation to study the phenomenon:

* Map plot where the measured attributes were plotted using a colour scheme for different bins on the values (decrease as red and increase as blue). Multiple versions of the map plots one for each of the study years were plotted next to each other to observe the temporal characteristics of the phenomena
* Histograms where used to present individual characteristics. Each bin represented one area in region of interest (i.e. concentric circles) and had one bar for each of the study years to illustrate the temporal effect of the event
* The produced model indicated a non-linear relationship between the VI and the CS which was also visually presented by the polynomial regression line plotted on top of the sample data

Zhibin Rena, Haifeng Zhenga, Xingyuan Hea, Dan Zhangab, Guoqiang Shena, Chang Zhaia, “Changes in spatio-temporal patterns of urban forest and its above-ground carbon storage: Implication for urban CO2 emissions mitigation under China's rapid urban expansion and greening”, Environment International, Volume 129, August 2019, p. 438-450

